BRILL'S SYMPTOM-COMPLEX; TYPHUS FEVER; MANCHURIAN TYPHUS *

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In 1910 Dr. Nathan E. Brill[1] published a clinical study based on 221 cases of a disease which he has observed during the last fourteen years in the wards of Mount Sinai Hospital. His definition of the disease in question is as follows: An acute, infectious disease of unknown origin and pathology, characterized by a short incubation period (four to five days), a period of continuous fever, accompanied by intense headache, apathy and prostration, a profuse and extensive erythematous maculopapular eruption; all of about two weeks' duration, whereupon the fever abruptly ceases either by crisis within a few hours or by a rapid lysis within three days, when all symptoms disappear.

Although these cases have been taken for typhoid fever by the greater number of New York physicians, yet there is no question that Brill is right in emphatically stating that this is an incorrect interpretation of the symptom-complex described. He publishes a tabular arrangement of the differences in the clinical pictures of the two diseases, which is quite convincing; more important yet is the fact that in none of the 221 cases observed was a Widal agglutination reaction obtained, and blood-cultures carried out under the supervision of Dr. E. Libman of the Mount Sinai Hospital were uniformly negative. Similar reasoning proves that the disease under discussion has nothing in common with the group of paratyphoid diseases, for in these also agglutination reactions and specific organisms have not been obtained. A committee of the Section of Medicine of the New York Academy of Medicine appointed to consider Brill's communication has agreed with Brill on these points.

Brill then considers the differentiation of his symptom-complex from typhus fever, the resemblance to which he admits, saying that "I should have felt that I had offered nothing to our nosology if it had not been proved that typhus fever had lost its virulence, that it was constantly present in a community, that it was not communicable, that when it was present epidemics of it did not occur, and that it was no longer a grave and fatal disease." "But," he adds, "with typhus fever as the great

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1. Brill, Nathan E.: An Acute Infectious Disease of Unknown Origin, Am. Jour. Med. Sc., 1910, p. 484.

masters of medicine have taught and as I have seen it, such a conception would be unjustifiable; therefore, I believe this disease not to be typhus fever."

It is my purpose to show in this paper that the conditions which Brill demands as the *sine qua non* of admitting that his clinical entity is typhus fever can be proved to exist, and that the disease in question is in no way different from a great number of typhus fever cases observed during epidemics in countries in which typhus fever is endemic or from sporadic cases observed in the United States and elsewhere. With all deference to the great masters of medicine who have differentiated typhus and typhoid fevers and have given us the typical description of the former disease, which description has been repeated constantly since in the text-books of countries where typhus fever is unknown or unrecognized, it must be noted as a serious omission on Brill's part to fail to acquaint his readers with the views of modern or recent authors who have observed cases of typhus fever while possessing all the advantages of the medical progress in differentiating other diseases from them, advantages which were absent in the time of the "great masters of medicine." The very reactions used by Brill in proving that his symptom-complex is not typhoid fever, namely, the agglutination tests and the blood-cultures, may be named among these advantages.

I was in active practice in western Russia for six years, during which I had the chance to observe three severe epidemics of typhus fever and constantly saw sporadic cases of the disease. Of course, as the etiological factor as well as the special pathology of typhus fever has not yet been discovered, it can be diagnosticated only by the clinical course, and the more I read Brill's description, the oftener I listen to discussions of the theme, the more inclined I become to identify "Brill's disease" with typhus fever. The fairly sudden onset of the affection, the fever curve, the duration of the illness, its termination, the nature of the eruption, the time of its occurrence, the intense headache, the relatively frequent occurrence of herpes labialis, the rapid convalescence, the occurrence of the disease in patients who have previously had typhoid fever, the frequent enlargement of the spleen, the complications involving the respiratory tract, all these I have seen in authentic cases of typhus fever occurring during epidemics and independently of them.

On several occasions Brill has emphasized the intense headache which dominated the clinical picture from onset to convalescence. Other observers dealing with typhus fever have laid stress on this point. Dillingham[2] states that among 560 cases of typhus, intense headache was the most constant symptom. It was either frontal, temporal or diffuse

2. Dillingham, T. H.: Diagnosis of Typhus Fever, New York Polyclin., 1893, p. 97.

over the entire head. In a sporadic case described by Cook[3] there was violent headache during the entire period of illness, the pain being characterized by the patient as "awful." To me this is one of the most striking features of typhus fever as I have observed it. I remember especially well an epidemic of typhus fever which was accompanied by an epidemic of small-pox. In the beginning of the disease, before the eruption, the mental diagnosis ran frequently thus: severe sacral pain — small-pox; severe headache — typhus fever.

In regard to the skin eruption, I have seen cases of the maculopapular type, but likewise other cases showing a roseola and petechiæ, or petechiæ alone or roseola alone. In the first communication, based on seventeen cases, Brill[4] described the eruption as a roseola. In his later communication, however, he states that at the time he committed a mistake, the eruption being maculopapular in all cases. In my opinion this retraction is not necessary; I have seen many cases of typhus fever with a roseolar eruption only, coinciding with Brill's early cases except that in two patients the eruption involved the face as well as the trunk and extremities. It should be mentioned that there are rare typhus fever cases which show no eruption at all, the diagnosis being possible only during epidemics. Biernacki[5] has described such cases and I have likewise seen them. Many of Dillingham's[2] cases had a maculopapular eruption, and the description of the eruptions observed by Clark[6] in forty cases which occurred on Blackwell's Island show many that resemble Brill's cases and those observed by me.

The affection of the respiratory tract was striking even in cases of medium gravity: conjunctivitis, coryza, bronchitis were of frequent occurrence, and these manifestations in children when the eruption was macular caused great difficulty in differentiating typhus fever from measles. In grave cases stupor was a marked feature among adults, so that catheterization, for instance, was frequently necessary even in early days of the disease; otherwise the nervous manifestations observed by me corresponded entirely with those mentioned by Brill. I have also seen cases during epidemics which showed fever and an exanthem only without any manifestations from the nervous system.

In my light and medium cases the disease lasted from ten to fifteen days, in a few cases not over a week and very rarely five days; in grave cases up to twenty-one days. The termination was usually marked by an

3. Cook, A. H.: A Case of Sporadic Typhus, Lancet, London, 1884, p. 676.

4. Brill: A Disease Clinically Resembling Typhoid Fever but Without the Widal Reaction, New York Med. Jour., 1898, p. 48.

5. Biernacki, E.: Typhus Exanthic. sine Exanthemat., Gaz. lek. Warszawa, 1894, p. 562.

6. Clark, L.: Some Observations on an Epidemic of Typhus Fever, Am. Med.-Surg. Bull., 1894, p. 647.

incomplete crisis or by a rapid lysis. If no complications occurred, patients could sit up in bed at the end of the fever and leave the bed a few days later. Thus, convalescence was usually rapid. Among complications were observed severe bronchitis, bronchopneumonia, pulmonary gangrene twice, pleurisy with effusion twice, rarely true nephritis, though febrile albuminuria was frequent. In a few cases which ran a fatal course diphtheritic sore throat appeared, usually in the beginning of the second week. Intestinal complications such as frequently occur in typhoid fever have not come under my observation. On several occasions considerable meteorism was present. In nearly all there was obstinate constipation, but in summer diarrhea was often present. Brill states that typhus fever does not occur in summer, but this statement is only partially correct; whenever there was an epidemic in winter, sporadic cases occurred in the following summer. One of the epidemics in which I was actively engaged commenced in February and lasted till August. The Berlin[7] epidemic of 1868 was not arrested until the end of July. It is usually assumed that patients are made immune by one attack of typhus fever, but I have certainly seen a repetition of the affection in the same individuals. In one case the first attack was mild, the second severe. In another instance the disease ran a medium course in both attacks.

I will now proceed to a consideration of the epidemiology of typhus fever, it being my object to present but a few features of the cases I have seen. Were I to present complete descriptions of my medium and light cases, it would amount simply to a repetition of Brill's elaborate communication.

Let us first approach the question whether typhus occurs only in epidemics, and the answer is: by no means. Typhus is endemic in many districts of Russia, so that sporadic cases are of constant occurrence there. In many other districts where hygienic conditions are very favorable, typhus fever is but little known, and if sporadic cases do occur, they are of a mild character. As examples of such localities may be mentioned the Baltic provinces of Russia and Finland. When sporadic cases running a mild course, and consequently not accompanied by any mortality, occur in large cities they are usually not recognized. These cases are generally designated as an "uncertain kind of typhus," in other words, "a disease of unknown origin." If one has observed typhus cases in the neighboring small towns, the conviction is soon forced on him that the sporadic cases in the large cities have been of the same character. Small towns are, in my opinion, in a more favorable position for the study of the various types of typhus, one of the reasons being that the entire clinical material passes through the hands of but one physician, as frequently is the case in Russia.

7. Obermeier, O.: Die ersten Fälle und der Character der berliner Fleck-typhus Epidemie von 1868, Berl. klin. Wchnschr., 1873, p. 349.

Typhus is endemic not only in Russia, but also in many other countries. Virchow[8] assumed that the endemic typhus of the Slav countries led to the epidemic outbreak in Berlin in 1867-68. Why endemic diseases do not lead to epidemics every day cannot be decided. However, according to Virchow, a special predisposition in the locality and, perhaps, the cooperation of accidental conditions may be responsible. According to Murchison,[9] many epidemics originate from local contagion which may have been preserved in an endemic way, or may have appeared because of hunger and dirt among the inhabitants.

The last epidemic in Breslau, according to Leonhardt,[10] came to an end in July, 1879. In the following years sporadic cases of typhus fever occurred, which in 1883 increased to thirty-six. In 1885-86 not a single case occurred, in 1887 and 1888 two cases each, and in 1892 one case.

In Edinburgh,[11] in the old town, typhus was practically endemic at one time. There was not a single year from 1880 to 1893 without typhus cases.

Vacher,[12] speaking of typhus epidemics in Ireland, said that the affection was not recognized for months, as the physicians did not know anything about the disease. According to him, defective medical education is responsible for this state of affairs, and no time should be lost to remedy it. Typhus, he says further, is not rare, and in large urban centers, where the medical schools are situated, sufficient cases for clinical instruction can be found if looked for.

In Italy and Bohemia the affection is likewise said to be endemic.

Occasionally in the literature there are reports of sporadic cases of typhus. In 1897, four cases were reported from San Francisco by Shanon.[13] In two of these cases the diagnosis was rejected by the local board of health, which subsequently designated them as typhoid. The competency of the physician who reported the cases could not be doubted, as he had had considerable experience with this disease in Central America. Massie,[14] a country physician, reported a sporadic case, adding that a second case had not occurred in the district. In 1897 a few cases of typhus were reported in London,[15] and in a few suburbs of the city

8. Virchow: Quoted by Obermeier (Note 7).

9. Murchison: Quoted by Obermeier (Note 7).

10. Leonhardt, M.: Ueber das Vorkommen von Flecktyphus und Recurrens in Breslau, Ztschr. f. Hyg. u. Infektionskrankh., 1897, p. 22.

11. Littlejohn and Ker: The Outbreak of Typhus Fever in Edinburgh, Brit. Med. Jour., 1898, p. 1704.

12. Vacher, T.: Typhus and Its Notification (The Lesson of an Epidemic). Pub. Health, London, 1890-91, p. 263.

13. Shanon, N. V.: Occidental Med. Times, Sacramento, 1897, p. 651.

14. Massie, T.: A Case of Typhus Fever, Brit. Med. Jour., 1898, p. 1134.

15. Dudfield, T. O.: Typhus Fever in London, Brit. Med. Jour., 1898, p. 967; Lancet, Lond., 1898, p. 1016.

there were even small epidemics. De Arellano[16] states that typhus fever is not endemic in the capital of Mexico, but is always present in a very extensive zone in the republic. From 1869 to 1891, not a month passed but cases of typhus occurred in Mexico, although epidemics in that interval have been reported only from 1873 to 1877.

These facts show that in many parts of the world typhus is endemic. The epidemic in Edinburgh, in 1899, proved that after eighteen years of immunity an epidemic can occur. From this the conclusion may be drawn that in a community typhus may be present for a long time without leading to an epidemic.

The history of typhus epidemics in New York proves that the disease occurred epidemically only after certain fairly definite intervals.

The first considerable epidemic in New York was in 1847, following the Irish famine of the same year; in 1861 the disease was again introduced by Irish immigrants, and did not finally disappear until three years had elapsed. Since that time it has been twice mildly epidemic in the city, in 1881 and again in February, 1892. In all these instances the fever was brought to this country from regions where it is endemic. In the opinion of Branan and Cheesman[17] typhus had never become endemic in New York, but has always disappeared when suitable hygienic measures were instituted.

Janes[18] asks how it is that the outbreak of typhus occurred in New York in 1881, after an absence of the disease for about fifteen years. It was believed by some at the time that it was brought by tramps from a city in a neighboring state where a number of cases had previously occurred, and this explanation seemed reasonable, although it was never shown to have been the case. He believes that in all probability the first case was a mild, unrecognized one, and was probably followed by others equally mild. This state of affairs, according to Janes, must have extended over a considerable period, until a resident physician in Riverside Hospital suspected typhus fever in one case. His diagnosis was confirmed by Dr. E. G. Janeway, at that time health commissioner. After the announcement of this case the epidemic became evident. Thus we see that Janes, eleven years previously, was not so optimistic as Branan and Cheesman. He believed that in New York typhus might be an endemic disease.

Brill's observations commenced in 1896, but one year before that, Hubbard,[19] of the Riverside Hospital, New York, reported "cases simu-

16. de Arellano, N. R.: Etiology and Prophylaxis of Exanthematicus Typhus, Am. Pub. Health Assn., Concord, 1893, p. 81.

17. Branan and Cheesman: A Study of Typhus Fever, Clinical, Pathological and Bacteriological, Med. Rec., 1892, p. 713.

18. Janes, E. H.: Typhus Fever in New York City, Am. Pub. Health Assn., 1884, p. 301.

19. Hubbard, S. D.: Cases Simulating Typhus Fever, Med. Rec., 1895, p. 21.

lating typhus." Why this author thought that his cases only simulated typhus and were not the real disease is unintelligible to me after having thoroughly studied his communication.

As an important reason for regarding the disease as "of unknown origin," that is, a clinical entity and not as typhus, Brill mentions the absence of fatal cases at the hospital. Since his communication first appeared, however, three fatal cases have been reported.

The mortality of typhus epidemics has considerably decreased through improved hygienic conditions and modern sanitation, but, of course, this mortality will always depend on the unknown "genius epidemicus," as is the case in other infectious diseases.

The Russian prison typhus still shows considerable mortality, perhaps as high as has been stated by the masters of medicine for the typhus fever in their time. *Vrach* (1909, p. 391) makes the following statement:

> Typhus in prisons is not an accidental manifestation, these institutions being the birth-place of the disease. It is the product of our prison conditions. True, the overcrowding of the prisons has not commenced yesterday, but it increases every year. Since they have never been empty, and new inmates are constantly arriving, the cells can never be thoroughly cleansed, much less disinfected when a prisoner falls ill. The prisoners starve even in the metropolitan prisons, unless they receive monetary help from outside.

Vrach (1909, p. 140) reports as follows: "A typhus epidemic broke out in a provincial prison, in which 1,317 prisoners have been crowded, although there was hardly room for 300."

Under these conditions a mortality of over 50 per cent. may be expected. In these prison epidemics, nurses and physicians succumb even at the present time. The mortality in hospitals and private houses is, however, not as appalling. I have no exact statistical material at hand from my three typhus epidemics, but I may state that the mortality was from 6 to 9 per cent. In one of my typhoid epidemics I have had a larger mortality (10 per cent.) than in the epidemics of typhus fever. This, of course, is easily explained by the fact that dietetic rules cannot be carried out as carefully in private practice among the poor, as in hospitals. Rigorous diet is not of such great importance in typhus as in typhoid fever, because in the latter intestinal perforation and hemorrhages from the bowels are to be apprehended, which is not the case in the other disease.

In eastern Prussia[20] the mortality amounted to 10.25 per cent. in the years 1868-69. Tcherepin[21] reported on the typhus epidemic in St. Petersburg during 1902 and 1903, as follows: "In a period of seven

20. Seliger: Die Flecktyphusepidemien in der städtischen Krankenanstalt, z. Königsberg, i. Pr., Berl. Klin. Wchnschr. 1888, p. 1028.

21. Tcherepin, S.: Die characteristischen Eigenthümlichkeiten der Flecktyphusepidemien in Petersburg im Jahre 1902-3, St. Petersb. med. Wchnschr., 1904, p. 52.

months 428 patients were treated in the hospital barracks. The majority of the patients belonged to the indigent classes; the mortality was 8.6 and 9.5 per cent., respectively."

In my sporadic cases there was rarely a death, as the majority ran a mild or medium course.

Dillingham[2] gives a description of "so-called typical cases" of typhus, in which recovery took place, and if they are carefully analyzed and compared with Brill's cases, the identity will be apparent. From Littlejohn's[11] statistics of endemic cases in Edinburgh it will be seen that from 1880 to 1889 the mortality was 28 per cent., from 1889 to 1898 only 14 per cent.

In less than ten years the mortality in Edinburgh was reduced by one-half. The mortality in my three typhus epidemics was small, possibly because most of my patients were Hebrews. My observations have shown that Hebrews are usually attacked by mild and medium forms of the disease and that the mortality among them is relatively lower than in other races. As most of Brill's patients were Russian Jews, the mild course and the low mortality may perhaps be explained from this fact. Of other races, a low mortality has been reported by Conseil[22] among Arabs. During the typhus epidemic in Tunis, in 1906, there was a mortality of only 5.4 per cent., and the affection showed a relatively mild course among the Arabs. For this reason the diagnosis of sporadic cases among them was difficult. Gourrier,[23] in 1903, did not have a single death in nine typhus cases among the Arabs. This opinion of the mild course of typhus fever among the Arabs is also shared by Franco.[24] These facts are perhaps of importance in Brill's cases, because his patients belonged to a race in which the course of the affection is much milder even during epidemics.

The most important argument which Brill presents is that the disease is not communicable, and up to a short time ago it was very difficult to discuss this argument. He writes:

> One of the nurses in training school, who, in December 1896, went through a severe typhoid infection, was attacked six months later with this disease, though at that time there was no other case of this disease in the hospital or training school. She was the only person I have seen developing the disease within the hospital.

Contagiousness, however, is a relative term. Such factors as unfavorable hygienic conditions and individual predisposition play an important rôle. It may surely be assumed that the contagious substance remains in the hospital and that many patients were not affected simply because they were not predisposed to the affection. This nurse had had typhoid fever

22. Conseil: Le typhus exanthémat. en Tunisie, 1906, Thèse de Paris, 1907.
23. Gourrier: Quot. from Conseil.
24. Franco, F.: Thèse de Paris, 1903-1904.

six months previously, and this may have been the determining factor. I have observed many cases of typhus fever in patients who had had typhoid in the same year. A house physician of the Mount Sinai Hospital told me that the hospital possessed the history of two members of the same family who had become infected with Brill's disease. Warren Coleman observed the affection in four members of the same family in Bellevue Hospital.[1] Dr. Lewis A. Conner told me of three sisters in the New York Hospital who almost simultaneously contracted the disease. But even all these cases do not demonstrate direct contagiousness. I do not think that contagiousness, except in the presence of unfavorable conditions or of predisposition, or both, has ever been positively demonstrated. There is to my knowledge in the entire literature only one case (this, however, is very instructive) of typhus fever transferred by inoculation from one individual to another, the author, Motschutkowski,[25] having made the following experiment on himself: From a patient suffering from typhus he obtained a little blood through a small skin incision; he inoculated himself with this and eighteen days later developed a typical typhus fever which took a similar course to that in his patient. Since this author had treated many typhus patients for four years without being affected, he concluded that typhus can be inoculated and that the infectious agent must be in the blood. I mention this case believing that it is singular in the literature.

There is hardly an infectious disease, the spreading of which depends so much on the hygienic conditions as is the case in typhus fever. Well-to-do people, or individuals who can afford the comforts of life, are not greatly subject to the infection. The disease, however, easily spreads in the dwellings of the poor and in lodging houses where there is bad air and little light.

Brill's cases were observed in the wards, not in the private pavilions of the hospital. Consequently, his cases came from the poorer classes, that is, from New York tenement houses. In buildings of this description several inmates are usually affected by the disease during epidemics.

Palatial residences, which are not secure from typhoid fever, scarlet fever and measles, are nearly always immune to typhus. In fact, during epidemics I have very rarely seen typhus among the better class of patients, and if in rare cases it did occur usually no other member of the family became infected, although no precautions in the way of isolation were taken. Whoever is acquainted with these facts will not be surprised that in the well-ventilated wards of the Mount Sinai Hospital, and other equally well-equipped hospitals of New York, nurses, physicians and other patients have not been infected.

In my town, in a small, well-equipped hospital, where during epidemic years there were many patients with typhus fever, as well as a few in

25. Motschutkowski: Ueber die Ueberimpfung der Flecktyphus, St. Petersb. med. Wchnschr., 1900, p. 30.

other years, I never observed infection of nurses or patients. I, myself, have been infected with typhoid and Asiatic cholera, but never with typhus, notwithstanding the fact that I came in close contact with patients during three epidemics.

Strümpell[26] says: "In the well-ventilated barracks of the Leipsic Hospital cases of infection with typhus fever of physicians, nurses or patients have only been isolated."

Yet Strümpell speaks of epidemics, Brill of sporadic cases of "acute infectious disease." Wyckoff,[27] referring to the epidemic of typhus fever in New York in 1892, reports "that the medical and inspecting staffs were spared." Of the nurses and sanitary police three or four only have contracted the fever and no one died.

According to Littlejohn,[11] during an outbreak of typhus fever in Edinburgh, seventy-eight cases were treated at the hospital in a few months. Not one of the staff who came into contact with the disease caught the fever. Statistics prove that typhus is not more common amid the dwellers of the houses in the vicinity of the Juarez Hospital in Mexico, than among those who dwell in other quarters of the city. According to Arellano,[16] at the said hospital, where there are always a great number of typhus cases, the disease does not spread among the patients who are in other wards of the same establishment.

Want of cleanliness, insufficient food or food of bad quality, fatigue and moral depression are, according to Brena, predisposing factors in the spread of typhus.

The disease has undoubtedly lost its virulence on account of good hygienic conditions and thorough modern sanitation. It is no longer to any extent a disease of important centers of population served by efficient sanitary staffs.

It now scarcely ever attacks the well-to-do who live in good houses. The fear of its assuming a wide-spread epidemic character no longer exists. It cannot at the present time even be called a prominent danger to armies in the field, or to beleaguered towns. But the disease still exists.

The diagnosis of typhus, according to Mahon,[29] is seldom made, or made only when the disease has become more or less epidemic. The name "influenza" covers a multitude of diseases.

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26. Strümpel, A.: Specielle Pathologie und Therapie der inneren Krankheiten, 1889, i, 43.

27. Wyckoff, R. M.: The Recent Incursion of Typhus Fever at New York, Maryland Med. Jour., 1891-92, p. 463.

28. Brena, T.: Rough Notes on the Etiology of Typhus Fever, Am. Pub. Health Assn., 1898, p. 206.

29. Mahon, R. B.: The Causes and Management of Outbreaks of Typhus Fever in Rural Districts, Jour. State Med., 1899, p. 394.

Before Matignon[30] came to Pekin, there was no typhus fever but a *fièvre de Pekin* which this author recognized as the European typhus fever. The predominating symptom in these cases was again intense headache.

How mild some of these cases may be is shown by a case of another author,[31] who writes:

> There are even ambulatory cases; in spite of high fever, prostration and cephalalgia, the patient can walk. A Chinese, sick for five days, with a temperature of 40.4 C. (104.7 F.) came on foot from a distance to the French legation to ask for a consultation, and was able to walk to the hospital, a distance of about 2.5 kilometers, or about a mile and a half.

From this case it may be seen how difficult it may be under certain circumstances to make a correct diagnosis in sporadic cases.

I now come to the discussion of the Manchurian type of typhus.

S. S. Botkin observed in the Far East a peculiar typhus with eruption, but without mortality or contagiousness. The pathological anatomy could not be studied, because there was no mortality. When the author read a paper describing his investigations, he found that the affection was known to the local physicians, who called it Manchurian typhus. During a discussion before a St. Petersburg medical society, a physician, Dr. Popoff, stated that he had likewise seen such cases in Warsaw, Poland.

S. S. Simnitzky[32] reported two house epidemics of Manchurian typhus fever in 1907 and in 1908. In both instances the lodging-house and prison of Harbin were visited by the disease. The first time five persons were affected, the second time nine. According to this author, the disease has only slight tendency to spread and caused but slight mortality.

B. A. Barikin[33] states in regard to the "so-called Manchurian typhus," that during epidemics of typhoid and paratyphoid there are occasionally cases which in Europe are regarded as typhus, but they are distinguished by slight mortality and slight contagiousness.

Horiuchi[34] succeeded in cultivating from the feces, and in a few cases also from the urine of patients, a well-characterized bacillus which, from its agglutination with the serum of the patient or of others affected with the disease, seemed to him to be the specific pathogenic factor of this affection.

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30. Matignon, J. J.: Le typhus des Européens à Pékin, Jour. de méd. de Bordeaux, 1896, p. 437.

31. Matignon, M.: Le typhus à Pékin, Arch. de méd. et Pharm. mil, 1897, p. 12.

32. Simnitzky, S. S.: Rûsski Vrach, 1907, No. 49.

33. Barikin, B. A.: Russki Vrach, 1909, No. 2, p. 46.

34. Horiuchi, T.: Ueber einen neuen Bacillus als Erreger eines exanthematischen Fiebers in der Mandschurei während des japanische-russischen Krieges. Centralbl. f. Bacteriol., xlvi, 586.

Ricketts and Wilder[35] quote and publish the most recent observations of the contagiousness and transmissibility of typhus fever and of related infections. According to them, Nicolle and his associates have shown that typhus could be transmitted to the chimpanzee by the injection of the blood of human patients and then the disease could be transferred from the chimpanzee to the macacus monkey. In the latter species it could be propagated by the ordinary body lice.

Spotted fever is a disease which, to judge by the descriptions, has a great deal in common with typhus fever. This disease has been specially studied by Ricketts and Wilder, who have shown that it is not contagious at all, being transmitted by the bites of certain species of ticks, so that the presence or absence of this variety of insect determines the state of the disease in any locality. So far as Mexican typhus, or tabardillo, is concerned, these authors are of the opinion that lice are probably the means of transmission of the disease. The flea is excluded from serious consideration because the season of the greatest prevalence of this insect does not coincide with the prevalence of typhus, while individual cases observed by them seem to absolve the bedbug from all blame in the matter.

The words of these authors[36] in reference to typhus fever deserve to be quoted literally, as they are very much in accord with the views defended in this paper:

> It is a peculiar fact that the conception of contagiousness has adhered to typhus up to, and including, the present time. Yet, in view of the facts that typhus, when endemic in the city, remains rather strictly segregated in the poor quarters, and that more or less intimate contact is required for transmission, it is manifest that contagiousness, if present at all, must be of peculiar character and of low grade. Typhus has never overwhelmed a whole city as small-pox did again and again in former times. In recent years, however, belief in the theory of insect transmission of typhus has extended widely, as affording a better explanation of the epidemiological features of the disease.

If Nicolle's results in transmitting typhus by means of lice be provisionally accepted, they throw additional light on the apparent immunity of Brill's ward patients to the infection from neighbors suffering with the disease he has described. It is well known that lice rarely travel from bed to bed as fleas and bedbugs do; more intimate contact than mere proximity is required for their migration and, with it, for the transmission of any infection they may carry. It may be accepted that the wards of the Mount Sinai Hospital show no exceptions to these observations.

I cannot enter here on the details of the clinical picture, but from descriptions the Manchurian type of typhus seems quite similar to Brill's and to the mild and medium cases which I have seen in European Russia.

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35. Ricketts and Wilder: The Typhus Fever of Mexico (Tabardillo), Jour. Am. Med. Assn., 1910, lv, 463.

36. Ricketts and Wilder: The Relation of Typhus Fever (Tabardillo) to Rocky Mountain Spotted Fever, THE ARCHIVES INT. MED., 1910, v, 361.

The various observations, both personal and taken from recent medical literature gathered in this paper, show that the symptom-complex described by Brill is identical with that of the mild and moderately severe cases of typhus fever. In other words, his cases are not a new "clinical entity" but examples of an old though nowadays but imperfectly known disease. Typhus contagium, too, may always exist in a community yet not necessarily lead to an epidemic at any definite time, for innumerable local conditions may be the determining factors in the development of an epidemic. Who knows but that the cases "simulating typhus" and reported by Hubbard and Brill are not direct descendants from the cases of the epidemic of 1892?

In any case, mere diminution of mortality and contagiousness should not lead us astray, for it is impossible to estimate the effect of modern hygienic and sanitary precautions on the character of such a disease of filth, hunger and poverty as typhus fever. Moreover, fatal cases have been observed by Brill in patients treated under the best conditions, that is, in the hospitals, and the mortality of from 6 to 9 per cent. observed by me in the general practice in a small Russian town does not then appear so greatly different. The fact that mostly Hebrews were affected among Brill's cases must also be remembered; the statistics I have mentioned in discussing typhus among the Arabs shows how important are the racial peculiarities in this connection.

Of course, time alone will decide the question of properly classifying the symptom-complex so ably observed and described by Brill. In the meantime, however, it does not seem to me to be part of wisdom to retain his nomenclature of a "disease of unknown origin," but rather call it New York typhus, just as the typhus of Pekin and of Manchuria has been named. This would go far in calling the attention of physicians to the clinical picture concerned, and, moreover, not connote something surely rare and unusual. The name "typhus" need cause no panic, as I have tried to show in the preceding pages, for it is no longer equivalent to the terrifying news, *Hannibal ante portas.* Modern conditions have robbed this scourge of mankind of much of its terror.

CONCLUSIONS

1. Typhus fever occurs sporadically in many regions.

2. Mortality from typhus fever no longer reaches the high figures quoted by old observers of the disease.

3. Typhus is little contagious wherever good ventilation, abundance of light and good hygienic conditions exist.

4. Epidemics of typhus may occur at very infrequent intervals even where the disease is endemic.

5. Brill's symptom-complex is identical with mild and moderately severe cases of typhus fever.

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